

**Commonwealth of Kentucky
Division for Air Quality**

PERMIT APPLICATION SUMMARY FORM

Completed by: Vahid Bakhtiar

GENERAL INFORMATION:

Name:	Lazar Anode Technologies LLC
Address:	1765 River Road Hawesville KY 42348
Date application received:	9/25/2008
SIC Code/SIC description:	3334, Primary Production of Aluminum
Source ID:	21-091-00029
Agency Interest:	102130
Activity:	APE20080001
Permit:	F-08-033

APPLICATION TYPE/PERMIT ACTIVITY:

<input checked="" type="checkbox"/> Initial issuance	<input type="checkbox"/> General permit
<input type="checkbox"/> Permit modification	<input checked="" type="checkbox"/> Conditional major
__Administrative	<input type="checkbox"/> Title V
__Minor	<input type="checkbox"/> Synthetic minor
__Significant	<input type="checkbox"/> Operating
<input type="checkbox"/> Permit renewal	<input checked="" type="checkbox"/> Construction/operating

COMPLIANCE SUMMARY:

<input type="checkbox"/> Source is out of compliance	<input type="checkbox"/> Compliance schedule included
<input checked="" type="checkbox"/> Compliance certification signed	

APPLICABLE REQUIREMENTS LIST:

<input type="checkbox"/> NSR	<input type="checkbox"/> NSPS	<input checked="" type="checkbox"/> SIP
<input type="checkbox"/> PSD	<input type="checkbox"/> NESHAPS	<input type="checkbox"/> Other
<input type="checkbox"/> Netted out of PSD/NSR	<input type="checkbox"/> Not major modification per 401 KAR 51:001, 1(116)(b)	

MISCELLANEOUS:

- ☐ Acid rain source
- ☐ Source subject to 112(r)
- ☒ Source applied for federally enforceable emissions cap
- ☐ Source provided terms for alternative operating scenarios
- ☐ Source subject to a MACT standard
- ☐ Source requested case-by-case 112(g) or (j) determination
- ☐ Application proposes new control technology
- ☐ Certified by responsible official
- ☐ Diagrams or drawings included
- ☐ Confidential business information (CBI) submitted in application
- ☐ Pollution Prevention Measures
- ☐ Area is non-attainment (list pollutants):

EMISSIONS SUMMARY:

Pollutant	Actual (tpy)	Potential (tpy)
PM/PM ₁₀	<90	8.66
SO ₂	<90	0.1492
NO _x	<90	29.049
CO	<90	23.0656
VOC	<90	248.81435
Single HAPs	<9	0.143
Source wide HAPs	<22.5	0.286

SOURCE DESCRIPTION:

The normal baking of anodes in the primary aluminum plant anode baking furnaces results in emissions of sulfur and fluoride compounds due to de-sulfurization and de-fluorodization of the green anodes as they cure in a chamber exposed to atmosphere. Lazar Anode Technologies, LLC has developed a new process to cure green anodes in a totally enclosed vertical column that is sealed to exposure to atmosphere. The new Lazar Anode Technologies process results in no de-sulfurization and no de-fluorodization since the fluoride and sulfur compounds in the green anode are at equilibrium with the packing coke inside the central heating chamber of the totally enclosed vertical furnace chamber. The new design for the anode bake is simply a double wall chamber. The inner chamber contains the green anodes and tightly packed-packing coke. The outer chamber is the combustion chamber where the energy from the “Fuel” is transferred from the outer ring to the sealed inner ring in the top or heating portion of the furnace, and the bottom of the furnace is a cooling section.

In principle, the green anodes are heated in the top of the furnace and cooled in the bottom portion of the furnace. The heating and cooling occurs in the absence of oxygen or exposure of the anodes/packing coke to atmosphere. This concept of heating and cooling the anodes in the absence of oxygen is the technical basis for the new process and results in the release of only trace amounts of organics, sulfur compounds, or fluoride compounds; unlike the traditional anode bake furnaces that release significant amounts of each of the above compounds.

The anode bakes are processed vertically in 10 stations with each process step taking 16 hours. The green anodes start at room temperature, go through a heating and baking cycle that brings the anode to 900-1200° C and cools it back down to room temperature at the bottom of the vertical furnace. The pressure in the sealed inside baking chamber is negative with respect to atmosphere. This negative pressure insures that the VOM release from heating the green anode cannot escape from the inner chamber at either to top or the bottom of the furnace chamber. The VOM is pulled out of the inner chamber at a point in the process where the interior temperature is approximately 200° C.

The VOM released during heating of the green anode is withdrawn from the inner ring at a temperature zone where the sulfur compounds and the fluoride compounds will not be in the gaseous phase (200° C or lower). The VOM is then used as the “Fuel” to heat the outer combustion chamber to 1200° C under normal operations. At this temperature in the outer ring combustion chamber, organics will be completely destroyed.

EMISSIONS AND OPERATING CAPS DESCRIPTIONS:

1. PM/PM10, VOC, NO_x, CO, and SO₂ emissions shall not exceed 90 tons per year based on a 12 month rolling total for the entire source to preclude a major source Title V review.
2. Hazardous air pollutants (HAPs), specifically HF emissions shall not exceed 9 tons per year individually and 22.5 tons per year combined based on a rolling 12-month total for the entire source to preclude a major source Title V review.
3. The maximum operating rate of green anodes is 5,722 tons of green anodes processed per year (7000 hours).
4. The total hours of operation per year shall not exceed 7000.

OPERATIONAL FLEXIBILITY:

None